

SARDAR PATEL UNIVERSITY
Programme: MSC (Integrated Biotechnology)
Semester: III
Syllabus with effect from: June 2011

Paper Code: PS03CIGB03	Total Credits: 3
Title Of Paper: Microbial Physiology	

Unit	Description in detail	Weightage (%)
1	Structural and functional relationship of bacterial organelles: Cell-wall - Structural properties, functions and biosynthesis of cell-wall peptidoglycan, Structure and function of cell membrane and its importance, Membrane transport systems, Structural components of spore, sporulation and germination process, Capsule and Calyx - Structural and functional comparisons, Flagella and Pili - Structural properties and its synthesis, functions, types and mechanism of movement	
2	Growth: Microbial growth and details of all the stages of growth curve, Balanced and unbalanced growth, Synchronous, continuous and diauxy growth, Modes of cell division, Quantitative measurement of bacterial growth, Factors affecting growth	
3	Microbial Metabolism: Energy Production: Energy metabolism, Respiratory chain, Energy production by aerobic processes - ETC, Oxidative phosphorylation and ATP synthesis; Energy production by anaerobic processes -Glycolysis, Pentose phosphate pathway, Entner-Doudoroff pathway, Fermentation; Energy production by photosynthesis	
4	Control of Micro-organisms: Control by Physical agents: Fundamentals of control - The rate of death of bacteria, conditions influencing anti-microbial action, Mode of action of anti-microbial agents Physical agents - High temperatures, Low temperatures, Dessication, Osmotic pressure, Radiation, Surface tension and interfacial tension, Filtration Control by Chemical agents: Characteristics of an ideal anti-microbial agent, Definition of terms, Selection of chemical agent for practical applications, Major group of anti-microbial agents, Evaluation of anti-microbial agents Chemotherapeutic agents and Chemotherapy: Historical highlights, Characteristics of antibiotics that qualify them as chemotherapeutic agents, Antibiotics and their mode of action, Microbiological assay of antibiotics, Microbial susceptibility to chemotherapeutic agents	
	Practical:	
	<ul style="list-style-type: none"> • Study of oligodynamic action • Effect of antibiotics / antibiotic on the growth of microorganisms/ microorganism • Effect of antimicrobial agents on the growth of bacteria • Study of growth curve by generation time • Effect of pH, temperature, osmotic pressure on growth of bacteria • Isolation of Actinomycetes and Fungi from soil 	



Basic Text & Reference Books:

- Microbiology by Pelczar, Michael J./ Chan, E.C.S./ Krieg, Noel R./ Chan, E. C. S. Publ: Tata Mcgraw-Hill Publishing Company Limited New Delhi, 2004 , Fifth edition
- Fundamental Principles of Bacteriology. (7th edition).A J Salle, Tata McGraw-Hill publishing company Ltd, New Delhi. **ISBN-10:** 1406707376 , **ISBN-13:** 978-1406707373
- General Microbiology, Stanier RY, Adelberg, E.A., Ingraham, J.L., 5th Ed. Wheelis M.L. and Painter P.R. McMillan Press ISBN 0-333-22013-7
- Prescott, Harley, and Klein's microbiology Publ : McGraw-Hill Higher Education New York, Seventh edition **ISBN-10:** 0073302082
- Brock - Biology of Microorganisms, Michael T. Madigan, Jhon M. Martinko and Jack Parker. (1997). 9th Ed. Prentice Hall International Inc, London.
- Martin Alexander
- Subba Rao
- Microbiology: An introduction by Tortora, Gerard J .Publ: Pearson Education , New Delhi, 2006 Eighth edition **ISBN-10:** 0805347917
- Principles of Microbiology, by Atlas, 2nd Edition by Atlas, Ronald M. Publisher McGraw-Hill College ISBN-10: 9780815108894
- Bergey's Manual of Determinative Bacteriology (Paperback)by John G Holt Publisher: Lippincott Williams & Wilkins; 9 edition (1994) ISBN-10: 0683006037
- Experimental Microbiology Volume 1 and 2 by Patel, Rakesh J. Aditya Publisher, 2004 Third edition

